IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF OKLAHOMA

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| STATE OF OKLAHOMA, ex rel, W.A. DREW EDMONDSON, in his capacity as ATTORNEY GENERAL OF THE STATE OF OKLAHOMA, et al. | ) | |
| Plaintiffs, | ) | |
| V. | ) | No. 05-CV-329-GKF-SAJ |
| TYSON FOODS, INC., et al., | ) | |
| Defendants. | ) | |

REPORTER'S TRANSCRIPT OF PROCEEDINGS

FEBRUARY 21, 2008

PRELIMINARY INJUNCTION HEARING

VOLUME III

BEFORE THE HONORABLE GREGORY K. FRIZZELL, Judge

APPEARANCES:

For the Plaintiffs: Mr. Drew Edmondson
Attorney General
Mr. Robert Nance
Mr. Daniel Lennington
Ms. Kelly Hunter Burch
Mr. Trevor Hammons
Assistant Attorneys General
313 N.E. 21st Street
Oklahoma City, Oklahoma 73105

(APPEARANCES CONTINUED)

For the Plaintiffs: Mr. David Riggs
Mr. David P. Page
Mr. Richard T. Garren
Ms. Sharon Gentry
Riggs Abney Neal Turpen
Orbison & Lewis
502 West 6th Street
Tulsa, Oklahoma 74119

Mr. Louis W. Bullock
Bullock Bullock & Blakemore
110 West 7th Street
Suite 770
Tulsa, Oklahoma 74119

Mr. Frederick C. Baker
Ms. Elizabeth Claire Xidis
Motley Rice LLC
28 Bridgeside
P. O. Box 1792
Mount Pleasant, South Carolina 29465

For the Tyson Foods Defendants: Mr. Robert W. George
Kutak Rock LLP
The Three Sisters Building.
214 West Dickson Street
Fayetteville, Arkansas 72701

Mr. Jay T. Jorgensen
Sidley Austin LLP
1501 K Street NW
Washington, D.C. 20005

Mr. Patrick M. Ryan
Ryan Whaley Coldron Shandy, PC
119 North Robinson, Suite 900
Oklahoma City, Oklahoma 73102

For the Cargill Defendants: Mr. John H. Tucker
Ms. Leslie Southerland
Rhodes Hieronymus Jones
Tucker & Gable
100 West 5th Street
Suite 400
Tulsa, Oklahoma 74103

(APPEARANCES CONTINUED)

For the Cargill Defendants: Mr. Delmar R. Ehrich
Mr. Bruce Jones
Faegre & Benson
90 South 7th Street, Suite 2200
Minneapolis, Minnesota 55402

For the Defendant Simmons Foods: Mr. John Elrod
Ms. Vicki Bronson
Conner & Winters
Attorneys at Law
211 East Dickson Street
Fayetteville, Arkansas 72701

For the Defendant Peterson Farms: Mr. A. Scott McDaniel
Mr. Philip Hixon
Ms. Nicole Longwell
McDaniel Hixon Longwell & Acord PLLC
320 South Boston, Suite 700
Tulsa, Oklahoma 74103

For the George's Defendants: Mr. Woodson Bassett
Mr. James M. Graves
Mr. Paul E. Thompson
The Bassett Law Firm
Post Office Box 3618
Fayetteville, Arkansas 72701

For the Cal-Maine Defendants: Mr. Robert F. Sanders
Young Williams P.A.
P. O. Box 23059
Jackson, Mississippi 39225

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PROCEEDINGS

February 21, 2008

THE COURT: Mr. Bullock, Mr. George, and Ms. Southerland and I spoke a second ago outside the courtroom with regard to evidentiary matters. We've been going at such a rapid pace and because there has been an agreement with regard to exhibits on direct, there have been promises made to the Court with respect to exhibits that have been used on cross that they would be handled at the next break or at lunch that has not been done. So the concern is that going forward, we need to handle this matter very quickly or it presents real

THE COURT: Rather than discuss it any further, let's take the next witness. And I'll just tell you how much time -- as you're running out of time, I'll tell you how much time we've got. And I'm going to start putting the stopwatch to it. Call your next witness.

MR. PAGE: Your Honor, the State calls Dr. Roger Olsen.

THE COURT: Dr. Olsen.

ROGER LEE OLSEN

Called as a witness on behalf of the plaintiffs, being first duly sworn, testified as follows:

THE COURT: State your name for the record, please.

THE WITNESS: Roger Lee Olsen.

THE COURT: Thank you, Mr. Page.

MR. PAGE: Thank you, Your Honor.

DIRECT EXAMINATION

BY MR. PAGE:

Q. Dr. Olsen, would you please summarize for the Court your education?

A. Yes, I have a bachelor of science degree in mineral engineering chemistry from the Colorado School of Mines in 1972, that's essentially a chemistry degree. Then I have my PhD in geochemistry in 1979 also from the Colorado School of Mines.

Q. Dr. Olsen, what work experience do you have that's related

to your opinions in this case?
A. Essentially after I got out of school, all my work since I graduated has been related to evaluating contamination in the environment.
Q. Okay. And what companies have you worked for?
A. When I first got out of -- while I was in graduate school, I actually was an instructor in chemistry and geochemistry for three years at the Colorado School of Mines. After I left the Colorado Schools of Mines, I was with Rockwell International for a year as a senior research chemist. And I went to a consulting engineering company called D'Appolonia Consulting Engineers that was bought out by International Technology. I was there six years. For the last 23 years I've been with Camp, Dresser, McKee or CDM.
Q. Now, as part of your work in the environmental field, has that involved designing sampling plans?
A. Yes, it has.
Q. How many sampling plans have you supervised the design for?
A. At least a hundred that I've been the major author or major contributor to.
Q. And would you explain to the Court the approach you follow when you design a sampling?
A. Yes, I've developed a systematic approach that I use that's kind of a step-wise approach. And the first approach is

the vast majority of those had poultry waste.
Q. And did you do a similar analysis for groundwater?
A. Yes, I did.
Q. And what did you find?
A. Again, for those samples of groundwaters that had bacteria and for which I had enough parameters to do the PCA evaluation, 67 percent of those samples had poultry waste in them.
Q. Again, what does that mean in plain terms?
A. It means that over two-thirds of those samples that had exceedances that I could evaluate had poultry waste contamination.
Q. Now, very briefly, Dr. Olsen, I want to finally look at Plaintiffs' Exhibit 454. And while you're getting that, I want to ask you a question. After you had your deposition taken in this case, did you discover that your statistical analysis was run with rejected data?
A. Yes, I just was doing some checking and of the actual results and looking at individual scores and individual contaminants, I noticed that there was some rejected data in the evaluations.
Q. How did that happen?
A. It wasn't in the data. It was in the database flagged right that we used, but we forgot to carry over those flags when we created subsets of data to do the PCA analysis on.
Q. So there was a problem with the query of the computer?

A. Yes.
Q. And how much of the data -- did you then run the evaluation with the proper data?
A. Yes, we did.
Q. How much of the data did you end up rejecting because it was rejected data?
A. There were, out of 14,700 pieces of data, that is actual analysis of contaminants that was in our PCA runs, we -- there were 677 rejected pieces of data out of the 14,700.
Q. How did that affect the number of samples you evaluated?
A. We had to drop 17 samples from the analysis. And those were all samples that were collected very early in the program and associated with some bad bacteria data that we had very early in the program. Essentially, we had to drop them because we no longer had the 20 out of the 25 parameters we needed.
Q. Was that the FoodProtech data was rejected?
A. That's right.
Q. And how many then total samples of what universe were dropped?
A. Again, we dropped 17. The analysis that I was just talking about and presented was based on 621 individual samples. We now have, without the rejected -- not including the rejected data, we have 604 samples.
Q. Okay. And did this rejection of the rejected data cause your opinions to change in any material way?

A. No, not at all.
Q. Would you briefly just explain what Exhibit 454 is?
A. 454 just shows the -- the runs with and without the rejected data. On the left is what we call the A, that's principal component 1, that's the chicken poultry signature that I've been testifying to. And then on the right is the same analysis done without the rejected data. You can see they're almost identical, all the high factors are similar --

MR. GEORGE: Your Honor.

THE COURT: Just one second, Doctor.

MR. GEORGE: I apologize for interrupting. I'm trying to recall where we drew the line but I believe that the Court's ruling was that the witness could certainly acknowledge that an error was made and state that it did not change his opinion, but now he's giving the substance of the new analysis in testimony.

THE COURT: Yeah, I expected some of this to come up in redirect and recross. So I think that the objection is well taken at this point in time. I understand where we are and the Doctor's testimony was consistent with what was told to the Court earlier about the rejected data. So Mr. Page.

MR. PAGE: I'll pass the witness, Your Honor.

THE COURT: Very well. Mr. George.

MR. GEORGE: Your Honor, I'm afraid if I get started, you won't want me to stop. It's going to be so exciting.

coliform bacteria in 2008 or 2009 if the Court enters the injunction your client requests?

A. Again, I've not been asked to answer that question.

Q. Sir, the sophisticated principal component analysis that you've discussed with the Court in your direct testimony will not tell us the relative contribution of sources in the watershed, will it?

A. Not as it is currently constructed. It will tell you the relative magnitude of those principal components.

Q. Well, sir, through your work in this case, you do not have a sufficient basis to offer a quantitative opinion, do you, sir, on the improvement of bacteria levels in the Illinois River Watershed if one source or potential source, poultry litter, is enjoined?

A. I have an opinion that it will vastly improve, but I haven't quantified that.

Q. You haven't quantified it, have you, sir?

A. That's right.

Q. You've done no statistical analysis to allow you to provide more detail on vastly improved; correct?

A. That's right.

Q. It's just your gut feeling; right?

A. No, sir, those principal components are very well defined. Those signatures are very well defined. The vast majority of impact is associated with principal component 1. So if you

Q. What are those variables?
A. Those are the contaminants that were analyzed for.
Q. And across the top there is a listing of factors. Do you see that?
A. Yes.
Q. And it appears to me it goes factor 1 through factor 5; is that right?
A. Yes.
Q. What are those factors?
A. Those are the principal components that we've been talking about, principal component 1 and principal component 2 that would correspond to factor 1 and factor 2 in this run.
Q. Okay. Now, beneath each factor is a long number that begins with a decimal; correct?
A. That's correct.
Q. And those numbers are loading values; is that correct?
A. These particular ones here are correlation coefficients. If you -- under the no rotation, they're actually directly proportional to the coefficients or the loadings that we actually use. So it's a number similar to this and the order would be the same but these aren't the numbers that are actually used in the final analysis of the component score.
Q. Now, Dr. Olsen, with respect to the factors, factor 1 through 5, the computer does not identify those as poultry; correct?

A. No, that's right.
Q. This is not a situation where you feed a bunch of chemical data into a computer and it prints out the word poultry as a source; correct?
A. That's correct.
Q. Now, let's go back a little further in the documents to the percent variance page. Can you find, Dr. Olsen, in the materials I've handed you, the page that shows the percent variance? You're familiar with that term?
A. Yes.
Q. And we'll pull it up on the screen so that Your Honor can see it. Sir, now, the computer generates a value for each factor amongst this data that was analyzed in terms of percent variance explained; correct?
A. Yes.
Q. I think you told me in your deposition that this is what you look at in making a determination about chemical signature; correct?
A. I said that was one of the factors. You remember I said the overriding factors was to try to keep as many as parameters possible and still explain a maximum percent of the variance.
Q. Right, but percent variance, the higher the percentage, the more comfortable you are with the idea that the factor described explains something in the data; correct?
A. As long as you have enough parameters in there. So

there's those two things you have to weigh back and forth.
Q. Sir, how many parameters were on this run of your PCA analysis?
A. Nineteen.
Q. And again, sir, on this page of the output, the computer doesn't identify factor 1 as poultry and factor 2 as point sources. Those are your determinations; correct?
A. That's right.
Q. You, Roger Olsen, look at these statistics and you decided to call principal component 1 the poultry signature; correct?
A. No, as I explained yesterday, I did several things. I ordered the factor scores so it isn't these statistics I looked at. And I also compared the signature or all these variables to known waste compositions.
Q. But those are your determinations, not the software's determination; correct?
A. Yes, and that's exactly what I tried to say yesterday.
Q. And your determination as to whether factor 1 is a poultry signature or something else is one that you make using your own judgment; correct?
A. That's correct.
Q. You decided, did you not, sir, that principal component number 1 in your PCA runs represents a source of contamination as opposed to just normal variation in the data; correct?
A. That's correct.

Q. You decided that principal component 1 represents a single non-point source of contamination from poultry litter rather than a combination of different sources; correct?

A. That's correct.

Q. Sir, have you subjected those conclusions regarding your interpretation of these results as indicating a poultry signature to the formal peer review process to allow scientists other than those retained by the Motley Rice Law Firm who are experienced in interpreting PCA results to evaluate the soundness of your methods and conclusions?

A. You mean like to a journal or something like that?

Q. Yes, sir.

A. No, we haven't at this time. We plan to do that.

Q. Dr. Olsen, out of all the scientists in the world who have studied water quality in areas where poultry production occurs, you're the only one, aren't you, sir, who holds the opinion that the list of parameters that we saw in your direct examination constitute a poultry signature?

A. Well, that poultry signature is specific to this basin and I'm the only one besides other scientists in our company and one outside reviewer that's looked at this. So no other people outside the group or our scientific reviewer has seen this, so no one else has made that conclusion.

Q. You recall being asked these same questions in your deposition, sir?

demonstrative exhibit. It shows your list of parameters?
A. Yes.
Q. Sir, the only bacteria in your signature for poultry litter is E. coli, fecal coliforms, Enterococcus and total coliforms; correct?
A. That's correct.
Q. You know, do you not, sir, that all four types of those bacteria are found in cattle manure?
A. I don't know that for sure but I suppose they are, yes.
Q. You know, do you not, sir, that all four of those types of bacteria are found in human waste deposited in septic tanks?
A. Probably so.
Q. You know, do you not, sir, that all four of those bacteria are included in the feces of wildlife that live in the Illinois River Watershed?
A. I do not know that for sure.
Q. You don't know that?
A. No. I'm not a bacteria expert.
Q. All right. Dr. Olsen, does your signature allow you to identify -- strike that. Let me approach it this way. Dr. Olsen, your signature does not allow you to identify any farm contracting with Tyson Foods, George's or any other defendant represented in this courtroom as a source of any area of water contamination in the Illinois River, does it?
A. You mean does it allow me to identify a specific farm?

Q. A specific farm under contract with one of the defendants.
A. No, I've not been asked to do that.
Q. Does it allow you to identify a specific defendant?
A. No, I've not been asked to do that.
Q. Going to Demonstrative Exhibit 461, State's Demonstrative Exhibit 461. Dr. Olsen, you prepared this map; correct?
A. That's correct.
Q. And I didn't quite follow this, so I want to discuss it with you. In your direct examination, there was some attention drawn to the green dots outside of the Illinois River Watershed.
A. Yes, sir.
Q. Do you recall that?
A. Yes, sir.
Q. And I think you described those as control areas; is that right?
A. There's three green dots. There's one right above the basin, that's Spring Creek. And there's two below the basin, far below the basin, not that far, kind of on the county line there that are Little Lee Creek. And there's a green dot that can't be shown here because it's Dry Creek, it's in the Buffalo Creek area. Those are the reference areas for surface waters. Those other three happen to be springs that were collected. I didn't really associate those were reference areas. Again, they were just trying to collect all the springs. So those are